EXECUTIVE OFFICE OF THE PRESIDENT

COUNCIL OF ECONOMIC ADVISERS

WASHINGTON, D.C. 20500

April 6, 1984

TO: Dick Levine

FROM: Macroeconomic Working Group

SUBJECT: Macroeconomic Scenario -- Response to Agency Comments
(DOD, Interior, State, and Commerce)

I)   Department of Defense

    A)   Assumed DOD expenditures -- DOD comments that the
submitted DOD expenditure pattern represents "flawed data
(which) will not provide a sound basis for improving the
stockpile."

The NSC Stockpile Review Group chairman in the minutes of
the Steering Group meeting of March 30, 1984, concluded that
"the data can be used to develop policy recommendations for the
stockpile pending completion of the ongoing DOD initiative to
quantify defense mobilization requirements." The Group agreed
that the Secretary of Defense's expenditure data of 2/15/84
would be used.

    B)   Real GNP

    1) The model overstates GNP -- DOD argues that a)
GNP is <u>overstated</u> due to overestimates of energy
efficiency and b) energy supply is understated due to poor
modelling of interfuel substitution and production.

Since criticisms in (a) are offset by criticisms in
(b), we do not think the sum of the two problems warrants
a different overall GNP assumption. In general, the
assumed level and composition of GNP provides for all DOD
requirements with ample civilian reserves.

    2) The Wharton model cannot provide an adequate
representation of GNP composition in wartime.

The working group did not accept model results on GNP
composition where a conflict with working group judgment
arose. The proposed GNP composition provides our best
estimate of the probable mix of GNP, given the scenario.

Classified by: <u>Various Agencies</u>
Declassify on: <u>OADR</u>

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The assumed level of GNP and its composition is not meant to be used as the sole basis for strategic industrial mobilization planning. Only that part of GNP which is deemed essential to the war effort warrants assurance of unimpeded production through stockpiling or other means. A recommendation of the size and composition of the GNP subset deemed nonessential (the "phantom" tier) is forthcoming. This recommendation will be coverd in the fothcoming I-O task report.

3) The model treatment of investment is inadequate.

As stated at the last Steering Group meeting: insofar as the model allocates investment to nonessential industries (i.e., civilian aircraft production) such investment will be reallocated or eliminated as appropriate prior to running final demand through the I-O model.

C) This methodology should not be used for other mobilization planning ("232 Trade cases and Title III program evaluations"). DOD provides no rationale for such a limitation. Previous Federal Government defense stockpile and Section 232 Trade Investigations, e.g., ferroalloys, fasteners, have been based largely on the same methodology and planning factors. Industrial mobilization planning for materials and production requires a consistent set of assumptions, methods, and planning factors. It would make no sense to plan on a 3-year conventional war for certain materials such as cobalt and a different war for ferroalloys. The Defense criticism is rejected for this basic reason.

II. Department of the Interior

Interior objects to the assumed halt in civilian auto production arguing that: a) these production facilities would be used for defense production and b) that spare parts for the current fleet will be required.

We agree completely with both observations. Our assumption that production of new civilian autos halts is entirely consistent with diversion of these facilities to military use. Auto parts and tire production was not assumed to stop. Annual wartime production was assumed to average $14 billion (1972$).

III. Department of State

State objects to the inflation rate path as unlikely. In particular the decline in inflation (to 3.9 percent) in 1986 is viewed as unreasonable given high utilization rates.

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We agree that high utilization rates <u>may</u> lead to higher "demand pull" inflation during the war years. However, the impact of a higher inflation rate on the composition of GNP is uncertain; hence a higher assumed inflation rate would not have materially altered the assumed distribution of GNP.

IV. Department of Commerce

Commerce requests resolution of DOD's questions concerning the value of the data DOD supplied.

Refer to the response provided to DOD on first page.

The final approved macroeconomic projections' report as per the Steering Group is attached.

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March 7, 1984

MEMORANDUM FOR: POLICY STEERING GROUP

FROM: MACROECONOMIC WORKING GROUP

SUBJECT: National Defense Stockpile Review:
                       Macroeconomic Scenario

The Primary Task

The task is to estimate the level of GNP that could occur during
a specified scenario (EMPB Scenario 3A) consisting of a 3-year
war, preceded by a 1-year mobilization effort. The primary
constraints on the level of GNP are the availability of energy,
labor, and capital and the likely path of energy conservation and
labor productivity. The war scenario assumes a disruption of oil
supplies, and therefore energy, particularly petroleum, emerges
as the binding constraint on the economy despite very optimistic
increases in energy efficiency. In this simulation, labor is not
a binding constraint, given the increase in productivity.
Physical capacity in the aggregate is probably not a constraint
on the economy though capital constraints would need to be
assessed more fully for defense-related industries. Not only
does the capital stock grow during the war, but capital can be
used much more intensively by double-shifting labor. While the
double-shifting of labor resources can increase output from a
given capital stock, this inevitably requires increased energy
use.

Initially a major conceptual question had to be addressed. While
the level of GNP, including defense and non-defense activities
implies certain materials inputs, the reverse is also true. If
these materials are not available, then the levels of GNP may not
be realized. The working group decided to estimate the maximum
level of GNP consistent with the binding energy constraint under
the assumption that the required supply of materials would be
available.

The scenario developed necessarily involved many judgements both
with respect to the internal structure of the Wharton annual
model, which was used to perform the simulations, and with
respect to the inclusion of other factors not adequately
reflected in the model. Many alternative simulations were
performed with the model to assess the impact of changing
assumptions with respect to fiscal policy, personal saving rates,
labor productivity, energy prices, and energy conservation.

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While simulations of this nature are highly uncertain exercises, the working group regards the results as providing a reasonable estimate of maximum GNP given the scenario.

Major Assumptions

The major economic assumptions occur in the Federal Government sector and the energy sector.

Federal defense spending in real terms (1972 dollars), as provided by the Secretary of Defense, rises from $80 billion in 1982 to $131 billion in 1983 (the year of assumed mobilization) to $338 billion in 1986 (the final year of the war scenario). Spending for defense in current dollars, which includes the effect of inflation, rises from $179 billion in 1982 to $1235 billion by 1986. These defense increases are partially financed by real reductions in non-defense purchases, transfer payments, and grants to State and local governments, and by increased taxes.

FEDERAL SECTOR
($ billions)

	1982	1983	1984	1985	1986
Receipts	617	754	1180	1536	1696
Outlays	764	929	1430	1841	2063
Defense	179	327	762	1084	1235
Other	585	602	668	757	828
Deficit (−)	−147	−175	−251	−305	−367

By 1986, the Federal deficit is $367 billion. This is well above estimates prepared for the Administration's 1985 budget. The deficit as a percent of either total government spending or GNP is substantially lower than during World War II, but substantially higher than during either the Korean War or the Vietnam War.

The energy price scenario was developed from an analysis of world oil markets that produced an estimated available supply contingent on the war scenario. Crude oil prices rise to $142 per barrel and gasoline prices reach $3.90 per gallon. Natural gas prices rise substantially, particularly following the decontrol of natural gas prices in 1985. Prices for coal rise but at a much slower rate.

	1982	1983	1984	1985	1986
Crude Oil ($/barrel)	30.57	56.91	138.42	142.44	141.60
Gasoline ($/gallon)	1.22	1.88	3.83	3.92	3.90
Domestic Natural Gas ($/MCF)	2.43	3.02	3.53	11.53	11.50
Imported Natural Gas ($/MCF)	5.15	9.33	20.16	19.51	19.48
Coal-Eastern ($/S.T.)	33.31	37.93	43.48	49.03	51.82
Coal-Western ($/S.T.)	14.54	16.49	18.47	21.32	22.53

Total available supply of energy to the U.S. is about 71 quads.
Petroleum supplies to the economy are cut sharply due to the
reduced availability of imports, which is only partially offset
by increases in domestic production. Petroleum supplies decrease
from 30 quads prior to the mobilization to 25 quads by 1986. We
assume that to a large degree other energy sources can displace
these lost petroleum supplies: natural gas and coal production
can increase to about 20-21 quads for natural gas and 19 quads
for coal; and nonfossil-fueled electricity production can expand
to the maximum extent feasible (given current plant construction
and high levels of utilization), thereby increasing about 25
percent over the period and supplying up to 8 quads of energy.

In general, market allocation of resources provides the most
efficient allocation and the highest levels of GNP. Controls
imposed by the government would result in a less efficient
allocation and less GNP. For this reason, petroleum allocation
and price controls were not assumed, but instead the Wharton
model was solved on the basis of price. This solution produces a
higher level of GNP than would be the case if controls were
assumed and modeled in a valid manner. A further reason for
solving the model on the basis of price is that rationing and
various price controls can not be modeled in a valid fashion by
the Wharton model, because the inefficiency of controls, e.g.,
misallocation of resources, is not captured by its equations.

During the 4-year mobilization and war period real GNP rises by a
total of 17.4 percent, powered by the dramatic increase in
defense spending, which is offset in part by reductions in
non-defense Federal spending, tax increases, and the drain on
consumer incomes caused by the increase in energy prices. The
civilian unemployment rate falls from 9.7 percent in 1982 to 6.6
percent, somewhat above the full employment level, by the final
year of the war. These projected unemployment rates exceed the
1.2 to 1.9 percent unemployment rates experienced during the peak
of World War II. A major difference between the World War II
unemployment rates and the current unemployment rates, however,
is that today, because of various changes in the labor force and
the working age population, full employment corresponds more
nearly to a 5 to 6 percent unemployment rate, whereas during
World War II the unemployment rate that corresponded to full
employment was probably close to 3 to 3.5 percent. Thus, this
simulation forecasts an unemployment rate that is about 1
percentage point above full employment, whereas during World War
II the unemployment rate was about 1 to 2 percentage points below
full employment. Furthermore, relatively high unemployment rates
during the projected scenario also result from the impact of the
energy constraints that restrain the potential growth in GNP and
from the strong growth in labor productivity which limits the
demand for labor at any given level of real GNP.

Inflation rises substantially, primarily from the direct and
indirect effects of energy price increases, and reaches a peak
rate of over 20 percent in the first year of the war. During the
4-year period the price level rises by about 60 percent.

ECONOMIC ASSUMPTIONS

	1982	1983	1984	1985	1986
Nominal GNP ($ billions)	3073	3490	4470	5398	5811
% CH	4.0	13.6	28.1	20.8	7.6
Real GNP (72 $ billions)	1485	1510	1592	1683	1744
% CH	-1.9	1.7	5.4	5.7	3.6
GNP Deflator (% CH)	6.0	11.7	21.5	14.2	3.9
Civilian Unemployment Rate (%)	9.7	10.2	9.0	7.2	6.6

Consumer spending in real terms increases by 5 percent during the 4-year period; durable goods purchases decline by 22 percent, reflecting a sharp decline in purchases of new cars. (Domestic auto production halts by assumption in the first year of the war.) Total consumption declines from 65 percent of GNP in 1982 to 58 percent by 1986. In World War II total consumption fell from 67 percent of GNP in 1940 to 45 percent in 1944.

Gross private investment increases modestly during the war. In part, modest investment growth reflects the higher interest rates that result from the higher rates of inflation and the expanding Federal deficit. The fairly high level of gross private investment is contrary to the World War II experience when, throughout most of the war, investment was the same or lower. Housing starts are assumed to decline from 1.7 million units in 1983 to 200 thousand during the last two years of the war. Business capital stock rises by about 12 percent, again quite contrary to the experience during World War II, when it declined. Major increases occur in mining, electrical and nonelectrical machinery, nonautomotive transportation equipment, and utilities. The model provides inadequate representation of investment by industry. Therefore, we have assumed that investment can be redirected towards any industries experiencing capacity shortfalls.

Labor productivity (output per employee) increases by 9 percent, about half the rate of increase in real GNP, essentially paralleling the experience in World War II.

Total energy use averages 69 quads per year, about 4 percent below the level postulated to be available. This is offset by the pattern of energy productivity growth generated by the model. The greatly increased price of petroleum causes the prices of other fuels to rise as they are substituted for the lost petroleum supplies. The higher prices for all forms of energy produce model estimates of more efficient energy use, and aggregate demand for energy falls as a result. Energy efficiency for the total economy improves by 19.5 percent during the four years, mostly because of the higher energy prices directly related to the scenario though also because of current trends set in motion by the price increases of the 1970's. This 19.5 percent increase in energy efficiency is greater than the increases experienced after the price shocks of the 1970's.

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Rather than fine-tune the Wharton long-term model to obtain a more realistic path of energy efficiency, we have retained this optimistic projection of energy efficiency and let it be partially offset by a small amount of excess energy availability.

This excess energy availability is entirely in coal. Production of all other fuel types reaches the highest levels that appear possible. The exception for coal is an artifact of how the model balances energy demand and supply. Demand and supply are balanced only in aggregate, not for each fuel type, and coal production is effectively the residual. Since total energy demand is less than total energy supply, and coal production is the residual, coal production is necessarily less than it could be.

Conclusion/Recommendation

The real GNP path in this scenario is recommended for use in estimating U.S. minerals demand to provide for defense and civilian needs. Estimates of defense requirements for stockpile determination purposes will cover 100 percent of projected defense demands. For that part of GNP that represents civilian use, only the portion deemed essential will be used in estimating civilian-related demand for stockpile goal purposes. The macro group will provide an analysis and recommendation as to what portion of civilian demand should be considered essential.

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Since June 1983, the National Security Council has chaired an inter-
agency group to undertake a comprehensive review of the National
Defense Stockpile and associated issues involving the Mobilization
Preparedness Industrial Base. The Assistant to the President for
National Security Affairs approved the wartime scenario involving full
mobilization and the Secretary of Defense has provided estimates of
DOD wartime expenditures. All working group reports have been
approved at the Assistant Secretary level by those agencies and
departments involved in the study, as planning factors for the
stockpile and the related mobilization preparedness base. The
Stockpile Study recommendations have been endorsed by the Assistant to
the President for National Security Affairs and, upon receipt of
Secretarial comments, will be forwarded to the President for review
and approval. (U)

Attached are the EMPB wartime scenario adopted by Judge Clark for
planning for a one-year mobilization three-year war (Tab A), and the
defense expenditure estimates provided by Secretary Weinberger for
this scenario (Tab B). Also attached are copies of the final reports
of the working groups on shipping loss factors (Tab C), wartime
reliability of minerals exporting nations (Tab D), the U.S. GNP
planning level (Tab E), energy (petroleum) supply and price
projections (Tab F), and domestic and international minerals supply
which were derived from the wartime scenarios and defense expenditure
estimates (Tab G). These reports made the following recommendations:
(U)

Scenario

The scenario (based on EMPB Scenario 3A) assumes full mobilization for
a three-year war following a one-year warning. The maximum force
level is about 5 million men with theatres of combat in Europe, the
Middle East and Korea. (S)

Previous Presidential guidance in the 1976 Stockpile Study envisioned
two theatres of combat with maximum forces during the three-year
planning period of less than 4 million men. (S)

Defense Expenditures

The Secretary of Defense endorsed a wartime defense expenditure
pattern which reaches a peak of $737 billion (1983$)*, a 310% increase
over the 1982 level of $179 billion. The SecDef has stated that DOD
is undertaking a thorough review of defense requirements under
Scenario 3A. DOD has advised the NSC that the current data are the
best available and are suitable for policy decisions until the
longer-term DOD study is completed. The longer term DOD study is
expected to be completed in about eighteen months.

The 1976 stockpile study selected wartime expenditures which peak at
$597B. (S)

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     * The above defense numbers have been converted from 1972
dollars with 1972 dollars being used in the actual study.

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Wartime Reliability of Mineral Exporting Nations

CIA, State, and DIA undertook a comprehensive review of the
reliability of wartime supplies from 26 major mineral exporting
nations. They considered political reliability and vulnerability to
sabotage under the scenarios, and they determined that 13 nations are
highly reliable for military and civilian needs, eight are fairly
reliable for civilian needs only, and five -- China, India, Zaire,
Zambia and Zimbabwe -- are unreliable. (S)

Present stockpile goals approved by the last Administration are based
on a 1979 probability scoring model which ranked Iran more reliable
than France or Ireland and South Africa less reliable than China or
the Soviet Union. (S)

GNP Planning Levels

The CEA-Treasury-OMB Working Group undertook a series of simulations
of the wartime economy under Administration economic policy
assumptions. They estimated that, even with substantial petroleum
shortages, the wartime economy could grow at an annual 5% rate,
sufficient to produce defense output and to meet civilian needs. (U)

Present stockpile goals are premised on assumptions of lower defense
spending and a robust civilian wartime expansion with high levels of
personal consumption. (U)

Energy

CIA, DOE, FEMA, DOD and OMB comprised the Energy Working Group. The
EMPB scenario envisions a major disruption of petroleum supplies from
the Middle East because of military activity. The Energy Working
Group has estimated that petroleum prices would rise substantially
throughout the scenario with resulting adverse impacts on
oil-consuming nations. For the U.S., the petroleum loss would be
partially offset by increased production of other fuels. (U)

Present stockpile goals are based on different assumptions that oil
prices rise very little throughout most of the war from peacetime
levels. (U)

Domestic and International Material Supply

The Bureau of Mines has provided estimates of possible wartime
supplies of the most significant stockpile commodities. They have
also estimated the likely domestic production increase from concerted
national programs such as were realized under the Defense Production
Act in the Korean War. (U)

Present stockpile goals assume that government demand for critical
minerals and concerted DPA programs will be unsuccessful in bringing
on required new capacity. (U)

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Shipping

A Navy, OSD, JCS, FEMA, OMB Working Group reviewed recent assessments of likely wartime damage to commercial shipping under the EMPB scenario. The conclusion of the group was that given the Administration's naval rearmament program, sea lane attrition losses would be comparable to the overall World War II loss level of 3%, with economic shipping experiencing even lower losses. (S)

The previous mobilization planning study made the assumptions that only 1-2% of each raw material destined for civilian consumption would be lost at sea, while 100% of the same material destined for producing military weapons would be lost. (U)

The Steering Group of the Stockpile Study has resolved the objections to the above studies which have been received from Assistant Secretary-level officials of concerned agencies. The attached reports represent the most significant planning assumptions to be used, as appropriate, for the stockpile and related industrial preparedness programs and investigations. The reports will be forwarded to the President with the recommendation that they be adopted for appropriate federal mobilization planning activities. Please provide comments and Department positions on each working group report for Presidential consideration not later than four working days from the date of this memorandum. Department comments should be at the Secretarial level.

Final Stockpile Goals will also be sent for Secretarial comments before being forwarded to the President. (U)

Paul B. Thompson

Robert M. Kimmitt
Executive Secretary

Attachments
Tab A   EMPB Wartime Scenario
Tab B   Defense Expenditure Estimates
Tab C   Shipping Loss Factors
Tab D   Wartime Reliability of Minerals Exporting Nations
Tab E   U.S. GNP Planning Level
Tab F   Energy Supply and Price Projections
Tab G   Domestic and International Minerals Supply